

UNOLS COUNCIL MEETING

20 September 1999

National Science Foundation, Room 1235
4201 Wilson Boulevard

Arlington, VA

For a PDF copy of these meeting minutes including all appendices click [HERE](#)

Appendices

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Welcome and Introduction – The UNOLS Council met in Room 1235 of the National Science Foundation on 20 September 1999. Bob Knox, UNOLS Chair, called the meeting to order at 0830. The agenda, [Appendix I](#), was followed in the order reported below. The participants of the meeting are listed in [Appendix II](#).

Accept Minutes – The minutes of the July 1999 Council Meeting were accepted as written.

COMMITTEE REPORTS:

The UNOLS Committee chairs provided written reports of their respective committee see [Appendix III](#). Bob Knox provided a summary of these reports as noted below.

Arctic Icebreaker Coordinating Committee (AICC) – The AICC has primarily been concerned with the construction of HEALY which is currently in the midst of Builders' Trials. Delivery is scheduled for early November 1999. UNOLS and RVTEC are coordinating science systems testing. Jack Bash reported that special effort would be given to multibeam testing on HEALY. Warm water testing of the science equipment is scheduled for January/February in the Caribbean. Cold water tests will be held in late spring in the Baffin Bay area.

DEep Submergence Science Committee (DESSC) – Utilization of and interest in the deep submergence facilities is high. DESSC plans to focus on future deep submergence science directions and facility planning. A workshop titled Developing Submergence Science for the Next Decade "DESCEND" will be held to solicit plans from the community for the future of submergence science. The meeting is scheduled for 25-27 October.

Fleet Improvement Committee (FIC) – The FIC's primary effort is developing a web based Biennial Review document. This will provide a "living" document for assessing the state of the fleet and identifying future ship needs of the oceanographic community.

Research Vessel Operators' Committee (RVOC) – The RVOC written report discussed the plans for

their Annual meeting to be held at Harbor Branch on 2-4 November. Topics such as international regulations and the NSF Review will be covered.

Research Vessel Technical Enhancement Committee (RVTEC) –The RVTEC written report provides plans for their upcoming annual meeting to be held in Port Aransas, TX on 20-22 October. It also provides details on the science systems testing for HEALY.

Ship Scheduling Committee (SSC) – Bob Knox summarized the committee report by explaining that there are still several pending projects. The NAVO work is likely to be funded at \$3M compared to the \$7.5M of the past several years. This shortfall will cause some ships to have light schedules. NSF projected Class I ship time in 2000 is greatly increased. Spreadsheets are attached to the SSC report and include a ship utilization spreadsheet for 2000, ship costs for 1999 and 2000 as well as a comparison of the two years, and NAVO priorities for 2000. Mike Prince reported that Joe Ustach (Duke/UNC) has been elected as the new Ship Scheduling Committee Chair. Dan Schwartz (UW) is the Vice Chair.

Federal Agency Discussion Period - Science program managers from the federal agencies were invited to raise any UNOLS related issues or topics of interest. No issues were raised at this time (the full agency reports will be provided at the UNOLS Annual Meeting).

UNOLS ISSUES:

NSF Academic Research Fleet Review - Don Heinrichs provided a summary of the findings of the NSF Academic Research Fleet Review. His viewgraphs are included as *Appendix IV*. The findings are outlined below:

Principal Findings:

- Current practices provide excellent access to the sea for U.S. researchers
- UNOLS services are meeting community needs and costs are comparable to other government and commercial operators.

Recommendations:

- The UNOLS system should be retained.

Programmatic findings:

- Potential for a near-term period of reduced use of UNOLS fleet by NSF grantees.
- Need for a strong continuing program for technology introduction, improvement of existing capabilities, and more systematic approach to maintenance and upgrades.
- Need to enhance quality control, training and safety procedures, and to develop even higher standards for shared use facilities.

Recommendation:

- Launch a significant campaign to upgrade and strengthen the fleet to prepare for increasing technological sophistication and improve future productivity and quality of fleet operations.

Operational findings:

- Continue practice of competing the management of the UNOLS Office.
- Needs for specialized capabilities are met in special circumstances from outside the UNOLS system.

Recommendations:

- Use a cooperative agreement for support of the UNOLS Office to ensure necessary management oversight.
- Consider a trial including some commercial ship operators as UNOLS non-member operators to provide unique fleet capabilities.

Planning findings:

- Ocean scientists must assess the future needs and opportunities of the field to establish priorities. A broad vision is essential to anticipate future fleet requirements.
- Federal agencies must improve long range planning for facilities with twenty to thirty year life spans, beyond the scope of NSF and UNOLS alone.

Recommendation:

- NSF must accelerate and expand efforts to articulate a broadly based vision for the future of ocean science and technology.
- Federal agencies sponsoring research in oceanography should develop a long-range plan for modernization and composition of the oceanographic research fleet that reaches well into the 21st century.

Don reviewed the issues of particular interest to the Council. A general discussion followed Don's presentation. The Council was concerned with the recommendation to charter commercial ships. Don explained that the recommendation did not include bare-boat charters for which there are often safety concerns and the add-on costs to provide a fully found ship normally bring the cost equal to or greater than UNOLS vessels. Chartering should be for special needs, those beyond the capability of the UNOLS Fleet. An example would be giant coring from the MARION DUFRESNE or a multi-channel seismic ship.

Don explained that the user surveys, conducted as part of the review, repeatedly called out the reliability of shared-use shipboard systems as a major concern. The committee feels that NSF and UNOLS operators should examine equipment issues to see if a list of shared-use equipment for each vessel and class can be identified and a quality-based system adopted fleet-wide to ensure that this equipment gets proper logistical and technical support. This should be a council issue to work with operators and NSF to determine how ships can better support science. The question was asked about how to measure quality, what benchmarks should be used? If the fleet were to be held to a standard this would need to be quantified. These are things that can be and need to be implemented by the UNOLS working groups. It is unlikely that new money will be available, but there will need to be some redirection of funds.

The user surveys voiced concern over accountability. What is the recourse of the user? Don suggested that each operator sit down with their respective ship committees to look over their operations and identify the areas that need improvement. Jim Swift noted that the AICC has been working with the USCG to ensure they will be operating in the UNOLS mode. Even if there were no more money, the Committee would argue that the community needs to put more a focussed management effort into the services support. Bob Knox asked the Council to think about concrete steps that can be taken in this direction.

The Review Committee was not satisfied with the cruise assessment response of 66%. It felt that a number closer to 100% should be pursued. At some institutions this objective is realized, at some it is not.

The recommendation for a Cooperative Agreement (CA) for the UNOLS Office came under discussion. Issues that will be included in the CA are an emphasis on cruise assessments, user support and technology improvements, evaluation of operator performance and continuous quality improvement. This improvement will include management training, continuous quality reporting and performance reporting. The cooperative agreement elements will be further discussed at the winter Council meeting.

NSF will be working with other federal agencies in developing a long-range strategic plan for fleet upgrades and replacement. This will be an agenda item at the upcoming FOFCC meeting.

[Future Fleet and Facility Utilization/Planning Session:](#)

UNOLS Biennial Review of Sea Going Oceanographic Facilities – Larry Atkinson began with an update on all FIC issues, see *Appendix V*. The FIC has added two new members to their committee, Dave Brzezinski (UCSB) and Dave Hebert (URI). Over the past year they have been involved with advising on the AGOR 26 SWATH project. Additionally, work on the Alaskan SMR is complete and the document is in the hands of University of Alaska.

The Biennial Review is a web based document or information source for fleet planning. The report will assess the current fleet and identify the future ship needs of the oceanographic community. Larry provided an outline of the report and encouraged everyone to look it over. The report is divided into five sections: the future, general information on the UNOLS Fleet, specific topics - new types of vessels, fisheries and hydrographic surveying, and technical issues. Many of the authors have been identified, but there is also room for more. The document may identify the need for additional SMRs.

ALPHA HELIX Replacement - Leonard Johnson (U. Alaska) provided a brief report on the efforts to replace ALPHA HELIX. Discussions have been held between U. Alaska and NOAA on how a replacement ship might provide support for NMFS science requirements. Jim Meehan, NOAA/NMFS, indicated that the first new FRV 40 being built will be going to Alaska but will be 100% utilized by NMFS, so that only piggyback UNOLS programs can be accommodated. Jim did say that NMFS has additional charter work that could be accomplished by an ALPHA HELIX replacement if the ship were outfitted for such service. A question arose as to whether U. Alaska's ship requirements could be met by another FRV 40. Concerns were raised about its ice strengthening and its limited lab spaces. Jim noted that there could probably be modifications to the ship to satisfy these concerns.

Bill Fox (NOAA) added that universities with an interest in fisheries are encouraged to contact NMFS. If these universities were thinking about designing new ships, they should consider a NMFS/NOAA partnership. NOAA often does not need a dedicated full time ship in an area, but could benefit by access during certain times of the year.

The planned construction time scale for the NOAA FRVs is to start construction of the first one in 2000 with an additional ship each year for the next three years.

East Coast Science Mission Requirements - Larry reported that the drafting of Science Mission Requirements for an East Coast ship has been tabled for the time being.

CAPE HENLOPEN Replacement – Dave McCarren (University of Delaware) reported that the University of Delaware is proceeding with plans to replace CAPE HENLOPEN, see *Appendix VI*. Institutional funds are being sought to assist in the replacement effort. They will be surveying the CAPE HENLOPEN user base to assist in the development of mission requirements. Replacement is tentatively planned for 2008, which would allow a few years of design planning before construction begins. FIC will be kept apprised of the progress and periodically plans will be submitted for review. They are considering fuel cell technology for the ship. Additionally, they are hoping to be able to implement an advanced communications link for virtual science party participation. They envision a replacement of roughly the same size and working region as CAPE HENLOPEN.

NAVO/Navy Ship Time – Gordon Wilkes reported that the future for NAVO funding is unclear. Congress currently has \$3M in the budget with an option to increase the amount to \$7.5M. There is NAVO work if funds are available. NAVO requirements for the future are likely to settle at the \$5M level for the next few years, provided the funds are available. Pat Dennis added that the NAVO funding of \$3M would likely be applied to survey work as opposed to data processing in 2000. The future work will be diverse and include shallow, deep, range, Pacific and Atlantic work. There is also work that could be done by the UNOLS Fleet if the EEZ problem can be overcome. Rich Hayes-(Oceanographer's Office) indicated that we need to come up with a plan on how to proceed. No one should conceive of the NAVO work lasting forever, there might come a time when the all military survey requirements are met. All

NAVO ships are forward deployed at this time.

(To accommodate various schedules, the following items were taken out of order from the printed agenda:)

UNOLS Brochure – The UNOLS brochure, being written and published by Vicky Cullen of WHOI, has been delayed but should be completed by the end of the year. The text is nearly complete. Photos are still being gathered.

Public Outreach Plans – Jack Bash reported that the educational book from USF and Peter Betzer is progressing. It is expected to have eight to ten chapters. Jack will be writing the sidebars, which will have a UNOLS slant. The book is aimed for the middle school level. It will take approximately two years to write. Funding is by private source.

Other outreach plans include a UNOLS booth at the Fall AGU. We encourage Council members to stop by the booth.

Fleet Planning (continued)...

UNOLS Role in Observatories Support – Dan Schwartz introduced the topic of observatories and the potential role of UNOLS. Establishment of an observatory at Juan de Fuca is in progress. The observatory will be hard wired to shore. The question of the UNOLS ship role was asked. For this type of observatory, cable laying and maintenance may require UNOLS fleet support. This would be an appropriate use for the fleet, not much different in nature than deploying moorings. The community needs to determine what the role of the ships will be and how this will impact the need for ships in the future.

NOAA Fishery Needs – Bob Knox gave a brief background and status on the NOAA/NMFS AMLR program. This program is primarily for fisheries research in Antarctic. NOAA solicited the academic community for the AMLR ship support. WHOI and SIO submitted a joint proposal. NOAA indicated that the proposal was good, but the cost was too high. As a result, NOAA sent a request for proposals out commercially. WHOI and SIO again responded, however, were disqualified because the commercial solicitation indicated that the proposal must include a liquidated damages clause. WHOI and the University of California cannot legally comply with this requirement. The future status of AMLR with respect to UNOLS ships is unclear at this time.

Bill Fox noted that in the past, the AMLR work had been done by SURVEYOR at a cost of \$2M per year. This is the level of funding available for the program. If all of the commercial proposals exceed this level, there may not be an AMLR program in the future.

Moorings as a Facility – At the last Council meeting, the topic of "moorings as a facility" was introduced by Dennis Hansell. A subcommittee was formed and they determined that the topic should be further examined. A mooring white paper was generated, see [Appendix VII](#). Unfortunately, Dennis Hansell could not attend this Council meeting due to Hurricane Gert. In general discussion it was noted that there is interest in long term moorings facilities. The topic needs to be looked at from an interdisciplinary perspective.

There will be a meeting immediately following the Annual Meeting in NSF Room 770. Bob Knox read an e-mail from Dick Pittenger concerning the moorings topic. He raised the question on whether or not this was an appropriate task for UNOLS. Additionally he raised the question and concern of whether this would strain the facility funds now available for ships. Don Heinrichs commented on the topic by noting that the NSF Fleet review committee was interested in seeing UNOLS being involved in other issues in addition to ships. Don referenced the name "UNOLS" and pointed out that it refers to laboratory systems and not specifically ships. It is time for an active dialog on these types of issues. Don views the test-bed,

experimental type mooring facilities as potential UNOLS assets. Sandy noted that NSF already supports the Bermuda test-bed mooring.

New Ship Construction:

- SAVANNAH – Jack Bash reported that Skidaway has not yet awarded the construction contract for their new ship, SAVANNAH. There are some internal funding issues that need to be resolved. The ship has been designed and a shipyard was identified to build the vessel.
- CALANUS – Tom Lee reported that the CALANUS replacement ship is under construction at Eastern Shipbuilding Group. The delivery date is January 17th. Tom showed viewgraphs of the ship's layout, see *Appendix VIII*. The ship is a catamaran and its features include:
 - Length = 96', Breadth = 40', and draft = 5'6"
 - Speed = 12 knots
 - a notched stern
 - 20 berths - 16 science party, 4 crew
 - moon pool
 - motion sensor system

U. Miami has been funded for a CTD, 10-inch profiler, fiber-optic computer network, and a Chirp Sonar. They are also submitting a proposal for a multibeam system.

Tom showed pictures of the ship being built. Construction began on April 23rd and is expected to take nine months for completion. The estimated cost for construction is \$4.2M. A day rate of \$6,600 has been estimated.

- **WHOI SWATH Plans**– WHOI has completed the design and model testing for their SWATH vessel. They are still identifying the funds needed for construction. Construction will not proceed until funds are available. They still have not decided whether or not to apply for UNOLS Vessel status. This will be decided when construction begins.
- **MTS SWATH session** – Jack Bash reported that two papers were delivered in the Ship Session of the Fall MTS Oceans conference in Seattle. One paper was on MBARI's WESTERN FLYER and the other paper was on the WHOI SWATH design. MBARI's deserves praise for identifying the ship problems and the remedies for them. MBARI is very pleased with the corrections. One of the initial ship problems experienced was loud noise. The ship has been quieted and also was able to increase its speed capability. The number of frames on the vessel was doubled. MBARI was very open with the community about the nature of the problems. Their philosophy is to take chances and in doing this they have high risk involved in projects. One lesson learned during this process was that ship designs need to be thorough and firm prior to going into the construction phase.

AGOR 26 Construction Update – Sujata Millick reported the Navy is still in the process of trying to award a contract for construction of AGOR 26. The project has been negotiated and it is anticipated that the contract should be signed in the near future. [Note, a construction contract was awarded in November to American Marine Inc.] Once construction begins, it is expected to take 22 months for completion. Robert Hinton is the University of Hawaii on-site representative, Lockheed/Martin is the design contractor and the Atlantic Marine is the builder. Pete Conroy of NAVSEA continued the AGOR 26 report with the operational capabilities of the vessel, see *Appendix IX*. The ship is designed to ABS and will be built to USCG Sub-chapter U requirements. Pete reviewed the operational capabilities as well as the mission equipment and ship systems. He showed charts of the seakeeping characteristics. The seakeeping analysis was conducted at zero speed. Pete provided various profiles of the ship with deck layouts. All of this material is included in Appendix IX. The cost of the entire AGOR 26 construction project is \$54M. The AGOR 26 design will be discussed in detail at the FIC meeting in November.

SEA CLIFF Report – There is no new status to report on WHOI's SEA CLIFF engineering study. They hope to have an update at the December DESSC meeting.

ATV Report – Sujata Millick reported that ATV is operating on a very reduced schedule. Peter Lonsdale

(SIO) used the vehicle in the spring with internal funds and was pleased with its performance. CORY CHOUEST has been serving as ATV's support platform. The future of the ATV is unclear at this time and no decision has been made by the Navy to retire the vehicle. The operating cost for the vehicle is now charged in full to the user; there is no longer a subsidy. Bob Knox recommended that if and when the Navy decides to retire the vehicle, they should let the community have an opportunity to respond. Sujata suggested that institutions interested in operating ATV should send their letters of interest to the Navy.

End Session on Future Fleet and Facility Utilization/Planning

Session on Ship Scheduling and Related Issues:

White Paper on Ship Scheduling – Jack Bash reported that the white paper on ship scheduling is still under development and is not available at this time. He will incorporate all comments received and then circulate it to the Council before posting it on the UNOLS website.

Progress Report on the New Ship Scheduling Procedures – Mike Prince provided the background and rationale for the new ship scheduling system. This year the full Ship Scheduling Committee met in mid July after many of the ship time funding decisions had been made. Schedules were reviewed and modified based on the funding decisions. Following the July meeting, the schedules were smoothed out. The scheduling review group met in September in a brief meeting to resolve any remaining issues. Mike thought that the process worked well this year and proposed that we keep the system. The only recommended change might be to eliminate the September meeting of the review committee. If necessary, the key players with unresolved scheduling issues could meet at that time. The issue of ship time letters of intent needs to be re-examined to determine if it was the most effective process. The letters were drafted by the schedulers in the spring and included all potential ship time (these replaced the very preliminary schedules of the past).

Mike noted that we need to also look at the ship time request forms themselves. There is a lot of information that is needed to effectively plan for major field programs. Jack Bash reported that approximately 80% of the ship time requests are now being submitted electronically. He also noted that the ship schedules could now be submitted and posted electronically with hyperlinks to the individual PI ship time requests.

Post Cruise Assessment Reporting – Jack Bash reported that there haven't been any recent changes to the post cruise assessment reporting process. Since the fleet review will address this issue, he felt that it would be best to wait and see if any specific recommendations are made. However, this is an area that will be addressed by UNOLS in the future with the ultimate goal of increasing the PI reporting level. Charlie Flagg indicated that his wife has professional experience in this field and is willing to assist. Jack noted that he has taken her suggestions for improving the report form and will apply them. Bob Knox asked Don Heinrichs what NSF would like to gain from the assessment process and in what timeframe? NSF will likely ask the operators, as part of their Cooperative Agreements, to respond to any negative assessments. Mike Prince said that for PIs to take the trouble to fill out the forms they must be assured that the reports are being reviewed and applied. UNOLS Office Cooperative Agreement might require a performance review of the operators in their role of assessment response.

There was a great deal of discussion on how to increase the submission level of the assessment reports and what type of data needs to be included in the reports. Many times the things being reported to the agencies or off-line to the operators are not on the form. We need a way to collect all data and respond to it. Somehow, the operator will need a more definitive method to assess their operation. Mike Prince indicated that we need to define a quantitative measure for measuring success. If the new assessment is made quantitative, the summary reports could easily be generated and the performance percentages quickly accounted for. Tom Lee indicated that there should be a header on the assessment form emphasizing that its information will be used for ship improvements and upgrades. The topic of anonymity was discussed. It was suggested that perhaps this role of watchdog should be given to the FIC.

Beth White reported that NOAA would provide a report on their shipboard logging system at the RVOC meeting. Their system might provide suggestions for improving the assessment process.

End of Session on Scheduling and Related Issues

UNOLS Office Transfer – UNOLS Office sent a message to the UNOLS membership after the last Council meeting asking for their concurrence to the selection of Moss Landing Marine Lab as the new host institution for the UNOLS Office. August 27th was the deadline for membership response and no negative responses were received. Bob Knox informed MLML of the membership approval. Mike Prince has submitted the Office proposal to NSF via Fastlane. Mike will visit the UNOLS Office at URI in October. He has been invited to attend all of the UNOLS meetings to get more familiar with the process. Mike is already very familiar with the Council, RVOC, RVTEC, and SSC. He has not attended DESSC or AICC meetings. The MLML proposal includes retaining Annette DeSilva as Assistant Executive Secretary. She will stay at URI. Don Heinrichs reported that the proposal would still need to be merit reviewed by all of the sponsors.

Winch and Wire Symposium – Jack Bash reported that plans for the Winch and Wire Symposium are well underway. Heroes have been selected for six different categories: the four basic science disciplines, one operator, and one ocean engineering. A winch and wire questionnaire was developed and distributed to the community. Questionnaires will be used by each hero to compile a two-page issues paper. The speakers will be asked to address these issues. The symposium is planned for 30 November to 1 December at Tulane University in New Orleans. This will allow participants to also attend the workboat show which will immediately follow the symposium. Most of the workshop speakers from industry are planning to attend the show as well. This will help to keep travel expenses to a minimum.

Dolly noted that winch problems are common in the fleet, but are often left off the assessment forms. Dolly encouraged spreading the word to the community, especially the scientists who have been complaining about the winches to attend the symposium.

DESCEND Workshop – Patty Fryer reported on plans for the "Developing Submergence Science into the Next Decade, DESCEND" workshop. At this time approximately 88 participants have pre-registered and of these roughly 60 are scientists. Patty reviewed the meeting tentative agenda – the first day will begin with a series of introductory presentations on submergence science and facilities. Most of the remainder of the day will be devoted to five breakout science sessions: Ridge, Abyss, Margins, Coastal, and Polar. Each participant will be assigned to a session prior to the workshop. Ridge is very popular and as a result will be split into two sessions. The coastal and polar sessions will be combined into one session. There will be two session leaders assigned to each session. In the late afternoon, we will ask the session leaders to provide a summary of their discussions in a general plenary session. The second day will have the same format as the first day, but will be devoted to technological sessions. The sessions are being split up by processes: event response, time series long and short, expeditionary, and global.

On the third day there will be a wrap up session in the morning. Jim Bellingham will provide insight into technology costs and realities. The afternoon will be devoted to the workshop report writing by the steering committee.

UNOLS/NMFS Memorandum of Understanding (MOU) – The UNOLS/NMFS MOU is under consideration by the NMFS. They received the draft just prior to the Council meeting. The Council endorsed the draft prior to it being sent to NMFS.

UNOLS/NOAA-OAR MOU – The UNOLS/OAR MOU is up for its two-year review. At the July Council meeting, the Council voted to readopt the MOU. The MOU is in Jim Baker's office (NOAA) awaiting signature at this time.

Application for UNOLS Vessel Status - The University of Miami has applied for UNOLS vessel status for their CALANUS replacement. The Council discussed the application and a motion was approved

subject to the vessel passing the requisite inspections.

Winter UNOLS Council Meeting – The schedule for the next Council meeting was briefly discussed. It was recommended that the week of 24 January be avoided since this would coincide with the Ocean Sciences Conference. It was also recommended to avoid the HEALY warm water testing schedule. MLML was suggested as a potential meeting site.

The meeting was adjourned at 5:00 pm.

Appendix I

9/1/99

A UNOLS Wine and Cheese Reception will be held following the Council Meeting from 6:00 – 8:00 pm at the Arlington Hilton & Towers, Gallery I (second floor).

**UNOLS COUNCIL MEETING
8:30 a.m., Monday, September 20, 1999
National Science Foundation, Room 1235
4201 Wilson Boulevard
Arlington, VA**

8:30 am Call the Meeting: Bob Knox, UNOLS Chair, will call the meeting to order at 8:30 a.m., September 20, 1999.

8:40 am Accept Minutes of the July 1999 Council Meeting.

8:45 am COMMITTEE REPORTS: Bob Knox will provide a brief summary of the UNOLS Committee written reports and open the floor to a question/answer period. (Prior to the meeting, Committee Chairs submitted written reports on activities since the July Council meeting for distribution to meeting participants.) Chairs will identify any important issues that need to be addressed further by the Council. *10 minutes per report for presentation and discussion combined, six committees.*

9:45 am Federal Agency Discussion Period: This is an opportunity for science program managers to raise UNOLS related issues or topics of interest. The full reports from Agency Representatives will be provided at the Annual Meeting on 21 September.

10:00 am Morning Break

UNOLS ISSUES:

10:20 am NSF Academic Research Fleet Review - NSF will provide a brief report on the NSF Academic Fleet Review, a full report will be provided at the Annual Meeting. Future implications of the recommendations will be discussed. In particular, the recommendation to fund the UNOLS Office by cooperative agreement rather than a grant will be addressed, as well as the Council's role in this process.

Future Fleet and Facility Utilization/Planning Session

11:30 am AGOR 26 Construction Update - Sujata Millick will provide an update on the Navy's construction of the AGOR 26 SWATH research vessel.

11:45 pm **The UNOLS Biennial Review of Sea Going Oceanographic Facilities** - Larry Atkinson will review the outline of the FIC report, *UNOLS Biennial Review of Sea Going Oceanographic Facilities*.

12:00 pm **Lunch Break**

1:15 pm **NAVO/Navy Ship Time** - The future course of NAVO/Navy needs for use of UNOLS ships will be discussed.

1:30 am **NOAA Fishery Needs** - Bob Knox will report on the status of NOAA's AMLR work off the Antarctic. A discussion on potential future fisheries work by UNOLS vessels will follow.

1:50 pm **Moorings as a Facility** - Dennis Hansell will report on activities since the last meeting regarding the concept of running deep-sea moorings as facilities.

2:05 pm **New Ship Construction** - Updates since the July Council meeting on the status of:

- Skidaway's plans for construction of R/V SAVANNAH
- Miami's construction of CALANUS' replacement
- Replacement of CAPE HENLOPEN
- WHOI's plans to build a SWATH vessel
- MTS SWATH session

2:20 pm **SEA CLIFF and ATV Report** -

SEA CLIFF - The status of WHOI's DSV SEA CLIFF engineering study will be reported.

ATV - Sujata Millick will report on the Navy's future plans for ATV.

End Session on Future Fleet and Facility Utilization/Planning

2:40 pm **Afternoon Break**

Session on ship scheduling and related issues

3:00 pm **White Paper on Ship Scheduling** – Jack Bash will review the latest modifications to the White Paper on ship scheduling.

3:15 pm **Progress Report on the New Ship Scheduling Procedures** – Mike Prince will report on the new ship scheduling procedures which were implemented this year on a trial basis.

3:30 pm **Post Cruise Assessment Reporting** - Jack Bash will report on the subcommittee's activities regarding the development of an electronic database system for collecting and summarizing Post Cruise Assessments.

End of session on scheduling and related issues

3:50 pm **UNOLS Office Transfer** - The proposal from MLML to host the UNOLS Office has been endorsed by the UNOLS membership. Mike Prince will serve as the new Executive Secretary starting 1 May 2000. He and Jack Bash will discuss plans for the Office transfer.

4:05 pm **Winch and Wire Symposium** - Jack Bash will report on plans underway to conduct a Winch and Wire Symposium in the fall.

4:20 pm **DESCEND Workshop Plans** - Patty Fryer will report on plans for the DEveloping Submergence SCience into the Next Decade, DESCEND. The workshop is planned for October 25-27, 1999.

4:40 pm Public Outreach Plans - Jack Bash will review 1999 public outreach projects and plans for the future: Betzer Book, UNOLS Brochure, Fall AGU, and UNOLS Tutorial on CD-ROM.

4:55 pm UNOLS/NMFS Memorandum of Understanding (MOU) - Jack Bash will review the status of the draft MOU between NMFS and UNOLS.

5:10 pm Two-Year Review of the NOAA/OAR and UNOLS MOU - Review of the UNOLS and NOAA/OAR MOU is required every two years. At the July meeting, the Council readopted the MOU. The status of the MOU readoption by NOAA/OAR will be provided.

5:20 pm UNOLS Brochure - A status report on the UNOLS brochure update will be provided.

5:25 pm 1999 Annual Meeting Plans - Any last minute plans or agenda items for the 1999 Annual Meeting will be discussed.

5:30 pm Adjourn

Calendar for UNOLS Meetings

MEETING	LOCATION	DATES
Scheduling Review	Arlington, VA	9 September 1999
UNOLS Council	Arlington, VA	20 September 1999
UNOLS Annual	Arlington, VA	21 September 1999
RVTEC	Port Aransas, TX	20-22 October 1999
DESCEND Workshop	Arlington, VA	25-27 October 1999
RVOC	Fort Pierce, FL	2-4 November 1999
FIC	Moss Landing, CA	9-10 November, 1999
Winch & Wire Symposium	New Orleans, LA	Tentatively 1-2 Dec 1999
DESSC	San Francisco, CA	12 December 1999
AICC	TBA	TBA

Appendix III **UNOLS** **Committee Reports** **September 1999**

Report to the UNOLS Council
September 10, 1999
James H. Swift, Chair AICC

The UNOLS Arctic Icebreaker Coordinating Committee (AICC) has had few activities since the last report in June. Reports received from the HEALY construction team indicate that USCGC HEALY is in the midst of builder's trials, including running in the Gulf of Mexico near the Mississippi delta. Both successes and problems have been noted in these reports, which have generally had a positive tone. An updated evaluation of status is expected by late October. One Coast Guard report did note: "Still anticipate being ready for NSF funded Arctic science CY2001".

Other recent AICC business has mostly centered on various email discussions of scientific equipment for USCGC HEALY and the Polar-class icebreakers.

Principal AICC activities in the coming months include:

- announcement of the 2000 Arctic Science-of-Opportunity cruise,
- an informal AICC meeting (no UNOLS travel support) on 19 October at Old Dominion University, ahead of the NSF Ocean-Atmosphere-Ice Interactions All-Hands meeting in Virginia Beach, 20-22 October,
- AICC representation at a panel discussion on Arctic logistics at the OAII meeting,
- AICC representation at the USCGC HEALY Ice Trials Meeting 27-28 October in New Orleans,
- plans for a community long-term planning workshop on Arctic icebreaker use at the 1999 Fall AGU meeting,
- plans for an AICC meeting in January 2000*, and
- extensive AICC participation in Coast Guard sea trials of USCGC HEALY during 2000.

[*The AICC meeting is proving difficult to schedule due to conflicts, especially with the HEALY tests and trials.]

DESSC Report to the UNOLS Council
Sept 10, 1999
Patricia Fryer, DESSC Chair

At its July meeting the DESSC heard the National Facility operator's report including the operations summary of a very successful 1998-1999. Also reported were operational summaries of other deep submergence activities including those of MBARI, MPL, the Navy, and ROPOS. We heard reports from the funding agencies NSF, ONR, and NOAA. The committee discussed revisions to the DESSC "Terms of Reference" and a revised document is being prepared for circulation to DESSC for comment. The final draft will be forwarded to the UNOLS Chair by the end of the year for consideration.

Scheduling discussions for deep submergence assets for the year 2000 and beyond emphasized the heavy use of these tools and highlights the increased level of funding of highly ranked deep submergence proposals. The committee discussed devising a mechanism for dissemination of information related to funded programs to potential PIs so that researchers will have the opportunity to plan collaborative work and to organize expeditionary science. Long-range planning issues discussed included science/logistical constraints, different vehicle requests, future global deep submergence initiatives in the Western Pacific,

Indian Ocean, S.EPR, Mediterranean, Polar Regions (DESSC identified a set of "area champions"), and the HURL RFP for Hawaii and Western Pacific initiatives. The DESSC is exploring ways to disseminate information to the deep submergence community regarding funded programs in order to facilitate collaborative research and greater success in proposing expeditionary science.

With an over subscribed schedule, the DESSC discussed future funding for deep submergence science (possible new mechanisms). Upgrades to National Facility vehicles, science sensors, and ATLANTIS were summarized by WHOI personnel and a detailed report was presented on the status of current upgrades proposed for the JASON ROV. We heard a report on the SEA CLIFF engineering study and a review of backlog items and pending projects of R/V ATLANTIS

DESSC discussed membership replacements for three of its retiring members. Several applications had been received from the community at large, but none fit the requirements for expertise that the committee will be losing. Thus, nominations were made from the floor and these individuals are being contacted. The DESSC will vote shortly on nominees and forward recommendations for new members to the UNOLS Chair for consideration.

DESSC discussed the DESCEND Workshop plans and the role of DESSC in preparation for and as follow up after the Workshop. DESSC will provide a critical watchdog to ensure that recommendations from the Workshop are carried out over the next few years. It will be instrumental in channeling suggestions from the community to National Facility operators and in helping to coordinate efforts toward improved deep submergence science throughout the community.

An announcement regarding the DESCEND workshop was sent out from the UNOLS office, following the DESSC meeting. Applications were solicited on line and all abstracts from potential participants, outlining their views regarding the scientific goals of their research and the technical advances they see as needed in the future, are viewable at the site. The deadline for applications to attend has past and a total of 86 scientists, engineers, technicians and administrators have applied to attend the meeting. The organization of the participants into break-out sessions is underway. Leaders have been chosen for each session. These individuals will meet with the steering committee in the evening prior to the Workshop to finalize coordination of the Workshop effort. We intend that a draft report will be finished by the Workshop Steering committee before they depart Arlington on Wednesday Oct. 27th. This report, we hope, will be ready for distribution at the DESSC meeting on Dec. 12 in San Francisco.

Fleet Improvement Committee
Report to UNOLS Council
Submitted by Larry Atkinson

FIC's main activities are preparing the Biennial Review, advising on the Hawaii AGOR 26 process, reviewing other SMR's and recruiting new members.

The Biennial Review is now on the UNOLS/FIC web site. Instructions for authors have been developed and the search is on for authors. We anticipate some initial products before the millennium.

The AGOR 26 process continues. FIC will have another review at the next FIC meeting in Monterey on 9-10 November.

UNOLS Council Meeting - 20 September 1999
Subj: RVOC Report
To: UNOLS Council
From: Paul Ljunggren, RVOC Chairman
13 September 1999

The 1999 RVOC Annual Meeting will be hosted by Harbor Branch Oceanographic Institute from on 2-4 November. The agenda includes a presentation by Jamestown Marine on Computerized Maintenance Systems, discussion of the Academic Fleet Review, and a presentation on the National Marine Fisheries Service's planned fishery research vessel, the FRV(40).

At the last meeting of the UNOLS Council the change to the RVOC Safety Standards were approved. As recommended by the Council an Index for the Safety Standards is being developed. The Safety Standards have been reviewed with a list of key topics being identified and the list of reference pages for each topic are being compiled.

The Safety Committee met in August at URI to review regulatory issues that required clarification. The committee noted when referring to the applicability of the regulations to vessels the regulations and international standards use terms such as "commercial vessels", "cargo vessels", etc. Use of such terms can provide for an interpretation in the narrowest sense which excludes most research vessels or in the broadest sense an interpretation in which it would be appropriate to include oceanographic research vessels. This is of greatest concern for uninspected vessels specifically with the international standards that have come into force and the practice of port state control. The Safety Committee plans to identify the areas of concern in a letter to the UNOLS Office and recommend that a Admiralty attorney review them and advise us whether or not research vessels fall under these guidelines. Once this review is completed the next step would be to address any unresolved issues to the Coast Guard.

An ongoing effort has been the preparation of a Small Research Vessel Primer. David Powell of RSMAS has been coordinating this effort. All, but one of the chapters in this collaborative effort have been completed. Among the topics to be covered are Requirements & Capabilities; Regulatory Issues; Safety; Stability & Seakeeping; Design & Construction; Conversion vs. Construction; Outfitting; SWATH Vessels; Catamarans; Selected New Designs; and Inventory of Small R/V's.

Sincerely,

Paul Ljunggren

Committee report from RVTEC to UNOLS Council 20 September, 1999

Plans for the 1999 RVTEC meeting in Port Aransas, Texas are beginning to take shape. The anticipated program will include a tutorial/work session on the implementation of netCDF as a UNOLS data standard and the ramifications of such a move. This has been a hot button issue off and on as there is increasing pressure from the community to move toward a uniform data set provided from ships to the science parties. The FIC formally, at last year's fall council meeting requested that RVTEC consider such a move. This has proven unpopular and difficult in the past due to differing computer platforms used for data collection and the wide variety of distribution media utilized. We have nearly succeeded in acceptance of the CDROM as a media and the logical next step is uniformity of data archiving. We also expect to have a program presenting advancements in data collection methodology and transmission. Two short presentations by working scientists presenting viewpoints from the consumer side have been scheduled, one is on new applications of underway surface meteorological data (e.g. IMET) and efforts to archive and promote these type of data and Lessons learned on how to set up data systems to measure true (earth-relative) winds. The second presentation is on ARGO. This is a large-scale float experiment that will involve many Marine Techs over the next few years. Our Vice Chair Tony Amos of UT has been working with Annette from the UNOLS office in setting up the logistic and social parts of the program which will include a reception at Aransas lighthouse. The meeting will convene on 20 October and conclude on 22 October.

Progress is being made on HEALY science trials in conjunction with the AICC. HEALY completed builder's sea trials on 2 September and the delivery date is expected to remain 29 October. This will place the Warm Water trial period sometime in January. This will mark the first direct UNOLS/AICC team involvement in the formal trials. The delays to date have been due to the inability to maintain the testing schedule upon which the original delivery date was predicated. Many of the problems with the propulsion

		Class	Updated	NSF	Navy	NAVO	NOAA	Inst	Other	Total	Funded	Funded
Atlantis	WHOI	1	09/02/1999	262			19		22	303	227	75%
Ewing	LDEO	1	08/29/1999	253					7	260	253	97%
Knorr	WHOI	1	09/02/1999	265	57					322	170	53%
Melville	SIO	1	09/06/1999	244			18	4		266	221	83%
Revelle	SIO	1	08/31/1999	206	107					313	304	97%
Thompson	UW	1	08/22/1999	81	20	50	10	66	28	255	169	66%
Endeavor	URI	3	08/30/1999	98	85	20	26			229	164	72%
Gyre	TAMU	3	09/02/1999	10	55			14	67	146	79	54%
Horizon	SIO	3	09/02/1999	54		30	23	38		145	92	63%
Johnson	HBOI	3	09/07/1999	168	4		86		1	259	172	66%
Link	HBOI	3	09/07/1999	53	72				45	170	124	73%
Oceanus	WHOI	3	09/06/1999	110	91		6		5	212	136	64%
Wecoma	OSU	3	09/12/1999	140	21		39			200	192	96%
Alpha Helix	U of Alaska	4	09/02/1999	95	0	0	21	1	29	146	78	53%
Hatteras	Duke	4	08/05/1999	103	17	30	31	10	9	200	83	42%
Henlopen	U of Del	4	08/26/1999	147	37				4	188	174	93%
Pt Sur	MLML	4	09/12/1999	42	56			15	54	167	90	54%
Sproul	SIO	4	08/30/1999	49	33			12	15	109	77	71%
Weatherbird	BBS	4	08/22/1999	130						130	130	100%
Barnes	UW	5	09/07/1999	36	5		10	13	10	74	32	43%
Blue Fin	Skidaway	5	09/07/1999	79	8		25		5	117	91	78%
Calanus	Miami	5	09/02/1999	45	26	35	61	6		173	136	79%
Laurentian	U. Mich	5	07/06/1999	232						232	232	100%
Longhorn	U of T	5	09/06/1999	20		30		28		78	78	100%
Pelican	LUMCON	5	09/02/1999	80	21	60	50	2	27	240	122	51%
Sea Diver	HBOI	5	09/07/1999	26	62					88	88	100%
Uracca	STRI	5	09/02/1999	15				105		120	15	13%
Totals				3043	777	255	425	314	328	5142	3729	73%
% of Total				59%	15%	5%	8%	6%	6%			
							Navy Total					

Last Updated on 01/13/2000
By Annette DeSilva...

COST 1999

YEAR:

1999

As of:9/8/99

SHIP/CLASS	NSF		NAVY		NOAA		OTHER		TOTAL DAILY		
	DAY	\$	DAY	\$	DAY	\$	DAY	\$	DAY	\$	RATE
R. REVELLE *	2	34	252	4,258	0	0	21	355	275	4,647	16,898
MELVILLE *	185	3,035	86	1,410	21	344	8	131	300	4,920	16,400
KNORR *	0	0	0	2,065	0	0	0	0	0	2,065	#DIV/0!
ATLANTIS *	277	4,377	0	0	56	885	2	31	335	5,293	15,800
EWING *	307	4,554	0	0	0	0	24	356	331	4,910	14,834
T.G. THOMPSON **	58	984	77	1,307	55	925	35	594	225	3,810	16,971
MOANA WAVE *	38	516	11	149	12	163	0	0	61	828	13,574
CLASS I/II	867	13,500	426	11,188	144	2,317	90	1,467	1,527	28,472	18,652
AVE: (7)	124	1,929	61	1,313	21	331	13	210	254	4,068	15,746
EDWIN LINK *	73	664	12	109	0	0	75	683	160	1,456	9,100
ENDEAVOR	189	1,881	0	0	24	239	0	0	213	2,120	9,953
OCEANUS *	150	1,695	19	215	0	0	5	56	174	1,967	11,305
GYRE *	10	72	80	624	0	0	97	753	187	1,449	7,749
NEW HORIZON *	94	818	72	626	23	200	40	348	229	1,992	8,699
SEWARD JOHNSON *	131	1,284	60	588	22	216	0	0	213	2,088	9,803
WECOMA **	41	449	44	482	92	1,008	0	0	177	1,939	10,955
CLASS III	688	6,863	287	2,644	161	1,663	217	1,840	1,353	13,010	9,616
AVE: (7)	98	980	41	378	23	238	31	263	193	1,859	9,652
PELICAN **	71	267	101	379	37	139	29	109	238	894	3,756
LONGHORN	14	56	0	0	0	0	35	140	49	196	4,000
POINT SUR *	49	332	79	536	2	14	49	332	179	1,214	6,782
CAPE HATTERAS **	52	431	92	762	0	0	19	157	163	1,350	8,282
ALPHA HELIX *	145	1,307	0	0	14	126	6	54	165	1,487	9,012
R. SPROUL *	97	592	11	67	0	0	43	262	151	921	6,099
CAPE HENLOPEN	106	585	67	370	0	0	11	61	184	1,016	5,522
WEATHERBIRD II **	138	1,038	0	0	0	0	4	31	142	1,069	7,528
SEA DIVER *	25	120	36	173	0	0	0	0	61	293	4,803
CLASS IV - TOTAL	697	4,728	386	2,287	53	279	196	1,146	1,332	8,440	6,336
AVE: (9)	77	525	43	254	6	31	22	127	148	938	6,198
BLUE FIN *	66	164	14	35	27	67	8	20	115	286	2,487
LAURENTIAN **	208	915	0	0	0	0	7	31	215	946	4,400
BARNES	78	125	0	0	7	11	25	40	110	176	1,600
CALANUS *	36	103	25	71	80	229	5	14	138	414	3,000
URRACA	15	68	0	0	0	0	94	491	109	559	5,128
< CLASS IV TOTAL	403	1,375	39	106	114	307	139	596	695	2,384	3,430
AVE: (5)	81	275	8	21	23	61	28	119	137	476	3,466
Fleet Total	2,655	26,466	1,138	16,225	472	4,566	642	5,049	4,907	52,306	10,661

AVE: (28)

Last Updated on 01/13/2000
By Annette DeSilva...

Cost 2000

YEAR: 2,000

As of:9/13/99

SHIP/CLASS	NSF		NAVY		NOAA		OTHER		TOTAL DAILY		
	DAY	\$	DAY	\$	DAY	\$	DAY	\$	DAY	\$	RATE
R. REVELLE	206	3,399	107	1,766	0	0	0	0	313	5,165	16,502
MELVILLE	248	4,092	0	0	11	182	4	66	263	4,340	16,502
KNORR	265	4,346	57	935	0	0			322	5,281	16,401
ATLANTIS	262	4,506	0	0	19	327	22	378	303	5,211	17,198
EWING	253	4,174	0	0	0	0	7	116	260	4,290	16,500
T.G. THOMPSON (revised 9/13 jmp)	81	1,375	70	1,188	10	170	94	1,595	255	4,328	16,973
CLASS I/II	1,315	21,892	234	3,889	40	679	127	2,155	1,716	28,615	16,676
AVE: (6)	219	3,649	39	648	7	113	25	431	286	4,769	16,679
EDWIN LINK	53	482	72	655	0	0	45	410	170	1,547	9,100
ENDEAVOR	98	1,009	85	876	26	268	20	206	229	2,359	10,301
OCEANUS	110	1,232	91	1,019	6	67	5	56	212	2,374	11,198
GYRE **	10	90	55	495	0	0	81	729	146	1,314	9,000
NEW HORIZON	54	524	30	291	23	223	38	369	145	1,407	9,703
SEWARD JOHNSON	168	1,646	4	39	86	843	1	10	259	2,538	9,799
WECOMA (revised 9/13 jmp)	140	1,523	21	228	39	424	0	0	200	2,176	10,880
CLASS III	633	6,506	358	3,603	180	1,825	190	1,780	1,361	13,715	10,077
AVE: (7)	90		21	515	26	261	27	254	194	1,959	9,997
PELICAN (revised 9/13 jmp)	80	300	81	304	50	188	29	109	240	901	3,754
LONGHORN (revised 9/13 jmp)	20	80	30	120	0	0	28	112	78	312	4,000
POINT SUR (revised 9/13 jmp)	42	294	56	392	0	0	69	483	167	1,169	7,000
CAPE HATTERAS	103	812	47	371	31	245	16	126	197	1,554	7,888
ALPHA HELIX	95	951	0	0	21	210	30	300	146	1,461	10,007
R. SPROUL	49	299	33	201	0	0	27	165	109	665	6,101
CAPE HENLOPEN	147	821	37	207	0	0	4	22	188	1,050	3,906
WEATHERBIRD II (revised 9/13 jmp)	130	1,082	0	0	0	0	0	0	130	1,082	8,320
SEA DIVER	26	125	62	298	0	0	0	0	88	423	4,807
CLASS IV - TOTAL	692	4,764	346	1,893	102	643	203	1,317	1,343	8,617	6,416
AVE: (9)	77	529	38	210	11	71	23	146	149	957	6,198
BLUE FIN	79	208	8	21	25	66	5	13	117	308	2,632
LAURENTIAN	232	1,044	0	0	0	0	0	0	232	1,044	4,500
BARNES	36	74	5	10	10	21	39	81	90	186	2,067
CALANUS	45	292	61	397	61	397	6	39	173	1,125	6,503

URRACA **	15	79	0	0	0	0	93	477	108	556	5,148
BLUE HERON	65	254	0	0	14	55	27	105	106	414	3,906
< CLASS IV TOTAL AVE: (5)	472	1,951	74	428	110	539	170	715	826	3,633	4,398
	79	339	15	86	19	97	29	122	144	644	4,471
Fleet Total	3,112	35113	1,012	9,814	432	3685.75	690	5,967	5,246	54,580	10,404

**NAVO CY2000
PROJECTED UNOLS
REQUIREMENTS**

**AT 3.0
MILLION**

**AT 7.5
MILLION**

	<u>Funding</u> \$=(000K)
Process	200
Acoustics	175
Services	175
Equip Lease	120
NAVO	<u>150</u>
	820

	<u>Funding</u>
Process	300
Acoustics	175
Services	300
Equip Lease	120
NAVO	<u>300</u>
	1195

<u>PRIORITIZED</u>	<u>Scheduled on</u>	<u>Ship Days</u>	
So. FLA Range	Calanus	20	
GOMEX (Carron)	Pelican	60	
ONSLOW	Hatteras	30	
SOCAL RANGE	New Horizon	30	
MIW WGOMEX	Longhorn	30	
NARRAG	Endeavor	<u>10</u>	
		180	<u>2160</u>

<u>Priority #</u>	<u>PRIORITIZED</u>	<u>Scheduled On</u>	<u>Ship Days</u>	
	So. FLA Range	Calanus	20	
1	GOMEX (Carron)	Pelican	60	
2	ONSLOW	Hatteras	30	
3	SOCAL RANGE	New Horizon	30	
4	MIW WGOMEX	Longhorn	30	
5	NARRAG	Endeavor (10 days)	15	
6	CAPE COD	Endeavor	15	
7	CENCAL P.O.	New Horizon	15	
8	MIDLANT P.O.	NOT SCHEDULED	20	
9	SoCal P.O.	New Horizon	15	
10	Pac NW P.O.	NOT SCHEDULED	<u>15</u>	
11	KEYWEST	Calanus	20	
12	SUBPAC (Hawaii)	Thompson (50 days)	60	
13	PUERTO RICO	NOT SCHEDULED	30	
14	TEX A&M	NOT SCHEDULED	<u>60</u>	
15			265	<u>4050</u>

*Last Updated on 01/13/2000
By Annette DeSilva...*

Appendix VII

MOORINGS AS FACILITIES: Rationale for an Assessment of the Concept

**UNOLS Council Working Group
D.A. Hansell, L. Atkinson, T. Lee, C. Reimers, T. Royer**

Purpose: The primary UNOLS objective, as written in the UNOLS Charter, "*is to coordinate and review the utilization of facilities for academic oceanographic research, access to those facilities and the current match of facilities to the needs of the academic oceanographic programs.*" Given these charges, the UNOLS Council has formed a Working Group to evaluate the ocean research community's need for ocean moorings operated in a facility mode. The term "mooring" here is meant to include traditional arrays of instruments spaced between a surface buoy and bottom anchor as well as bottom-mounted observatories.

Goal: The Working Group seeks to identify the needs of that portion of the community requiring access to moorings for the conduct of research, instrument and sensor development and testing, etc., but who neither need nor desire to maintain moorings within their research programs. Operation of a mooring as a facility would be beneficial, for example, if it accelerated development or evaluation of ocean sensors required for evolving needs, such as broad scale ocean observing systems. The data streams produced in time series mode over the life of the mooring facility should be beneficial to interdisciplinary ocean research programs if the sites for operation are selected carefully.

Community Pressure: The need for developing and testing *in situ* instrumentation and sensors, as well as to conduct remote research, is increasing. A portion of the impetus for this work comes from the evolving ocean observing programs for climate and carbon; part from the research interests of individual scientists. There is increasing pressure from the ocean research community for access to moorings. Existing moorings that have attracted high user interest include those located at the sites of the US JGOFS time-series stations (BATS and HOT). The Bermuda Testbed Mooring (BTM) is a good example of a mooring that has become a "mooring of opportunity" for many scientists. This mooring work, led by Dr. Tommy Dickey and supported by NSF and ONR, has attracted numerous users from several institutions. The opportunity provided by the BTM for the advancement of many lines of research, in addition to its own priorities, has been valuable. These opportunities need to be made available to the entire community of scientists at a few sites selected to meet the broadest needs of the community.

Analogy to the Deep Submergence Vehicle Facility: A mooring operated in facility mode would be analogous to the current arrangement for the deep submergence vehicles, with their ready availability to ocean scientists and cost transparency. These vessels operated for the U.S. academic community become available to scientists through the proposal system. The composition of the deep submergence fleet is,

ideally, driven by the needs of the community. The vessels are maintained as facilities by institutional operators, with operating and maintenance funds provided by the funding agency to the operators. The deep submergence facility is coordinated and overseen by UNOLS through DESSC, the Deep Submergence Science Committee. This very successful model makes the operation and maintenance of these vessels transparent to the users, thereby increasing the user's productivity and efficiency in the conduct of science. Such a model should be beneficial to members of the community who rely on moorings for their work.

Facility Design: A mooring facility could take many forms. However, it should be a cost effective design, suitable to the interdisciplinary needs of the broader community, and operated at one or more carefully chosen sites. The facility could comprise a set of relatively inexpensive moorings, available for quick deployment and turnaround, and deployed over a spatially relevant grid as demanded by individual projects. Alternatively, a larger, single mooring could serve as a facility. This latter model may result in a facility less responsive to the needs of individual scientists, with turnaround based on the needs of the many rather than the few. As is the case with common use underway sensors on the research vessels, the mooring facility might have a suite of sensors for commonly essential meteorological and hydrographic measurements, perhaps with real time transmission of data to the shore base of operation. These facility-supported sensors should meet the broadest needs of the users.

Concept Evaluation: A small workshop including mooring operators (such as T. Dickey, D. Frye, M. Abbot, B. Weller, T. Cowles, etc.) and mooring users (such as E. Sholkovitz, S. Emerson, E. Boyle, etc.) should be held to identify costs, suitable locations and the mechanisms of facility oversight and operation. A successful facility will meet the needs of the community of users; such should be the ultimate goal of the workshop.

Conclusion: An increasing role for moorings in oceanographic science has been predicted and discussed for several years. The rate-limiting step for this rise in research has been the relative inaccessibility of moorings to the broader community of ocean scientists. Operation of a mooring in facility mode will take the operational concerns out of the hands of the scientists, opening the way to increased scientific productivity and efficiency. The emerging demands of ocean science will be supported through such a facility. An assessment of the need, costs and operating profile must be made.
